

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930



BE GROUP

HOT FINISHED STRUCTURAL HOLLOW SECTIONS BE GROUP SVERIGE AB

Programme:
The International EPD®

Programme operator:
EPD International AB

EPD registration number:
S-P-04887

Publication date:
2021-10-29

Valid until:
2026-10-28



*An EPD should provide current information and may be updated if conditions change.
The stated validity is therefore subject to the continued registration and publication at www.environdec.com.*

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	BE Group Sverige AB
Address	Krangatan 4B, 211 24 Malmö
Contact details	info@begroup.se
Website	https://www.begroup.se/

PRODUCT IDENTIFICATION

Product name	Hot finished structural hollow sections
Additional label(s)	
Product number / reference	Hot finished structural hollow sections
Place(s) of production	Sweden
CPC code	4126 - Bars, rods, angles, shapes and sections, cold-processed or further worked, of iron or steel; angles, shapes and sections, hot-rolled, hot-drawn or extruded, of alloy steel; steel wire

The International EPD System

EPDs within the same product category but from different programmes may not be comparable

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The International EPD System
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the Int'l EPD System PCR 2019:14 Construction products, version 1.11 (05.02.2021) is used.
EPD author	Jens Karlsson, BE Group Sverige AB
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
Verification date	2021-10-21
EPD verifier	Hetal Parekh Udas, One Click LCA Ltd
EPD number	S-P-04887
Publishing date	2021-10-29
EPD valid until	2026-10-28

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Hot finished structural hollow sections are tubular products produced from steel coils. The coil is slitted to strips with appropriate width and then formed by rolling into the shape of the tubular product. The two strip edges, now lying next to each other, are welded together using a high frequency induction process. Further sets of rolling gives the final shape and size of the cold formed hollow section, and after trimming of the external weld bead and non-destructive testing, the tubes are cut to length prior to hot finishing. The subsequent hot finishing process comprises a reheating operation, and with the section at a normalising temperature of approximately 900 degrees Celsius, a further shaping and sizing operation imparts the product's final dimensions and properties before despatch.

PRODUCT APPLICATION

Hot finished structural hollow sections are primarily used within the construction industry for load-bearing structures. However, they also find their application in machines, vehicles and other equipment. Compared to a cold formed hollow section the hot finished section have lower internal material stresses which implicates less risk for changes in dimensional shape when the material is further machined, cut or welded. Another advantage with the hot finished hollow section comes with a sharper corner radius that makes it easier to connect profiles to each other. Hot finished sections also have a higher load-bearing capacity.

TECHNICAL SPECIFICATIONS

Hot finished structural hollow sections have their chemical composition, mechanical properties and other delivery conditions specified according to the European standard EN 10025. Dimensional tolerances are specified according to EN 10210.5

PRODUCT STANDARDS

Hot finished structural hollow sections have their chemical composition, mechanical properties and other delivery conditions specified according to the European standard EN 10025. Dimensional tolerances are specified according to EN 10210.

PHYSICAL PROPERTIES OF THE PRODUCT

Hot finished structural hollow sections, used in different applications, can as all steel products at the end of life be 100 % recycled into new raw material. More detailed technical information and assortment presentation of hollow sections can be found on our website:

<http://edu.begroup.se/produkter/ror/halprofiler>

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at <https://www.begroup.se/>

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Steel
Weight, kg	1
Post-consumer %	19
Renewable %	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

BE Group purchase hollow sections from suppliers (A1). The exact allocation of volume between suppliers varies over the years depending on supply and cost. The sections are delivered to the sites in Malmö and Norrköping (A2) where they can be shot blasted, painted, cut and machined as requested by customer or delivered to customers in standard stock lengths (A3). Some are delivered directly from the supplier to the customer. The transport from suppliers is made by ferry, railway and/or lorry, the products are bundled, sometimes with steel wires. When sent to customers from BE Group site the products are either just bundled or also secured with steel strip with clips, if cut in short pieces EU pallets are used. During loading and unloading or displacement of the product diesel powered trucks are used. Electricity used at the site is fossil free, waste from production is steel scrap (A3).

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Transportation to customer site goes either directly from the supplier or from BE Group warehouse (A4). Transport from BE Group is done by lorry which mostly use renewable fuel, 82% of all transports. Stockholm has been chosen as a proxy for customers location, that means in average 400 km distance when shipping from BE Group warehouses in Norrköping and Malmö. For transport directly from the supplier to customer site, the distance from the supplier to Stockholm have been used. Vehicle capacity utilization volume factor is assumed to be 1 which means full load. Empty returns are not taken into account as it is assumed that return trips is used by the transportation company to serve needs of other clients.

A5 is excluded in the scenario since BE Group do not have knowledge of how the installation is executed.

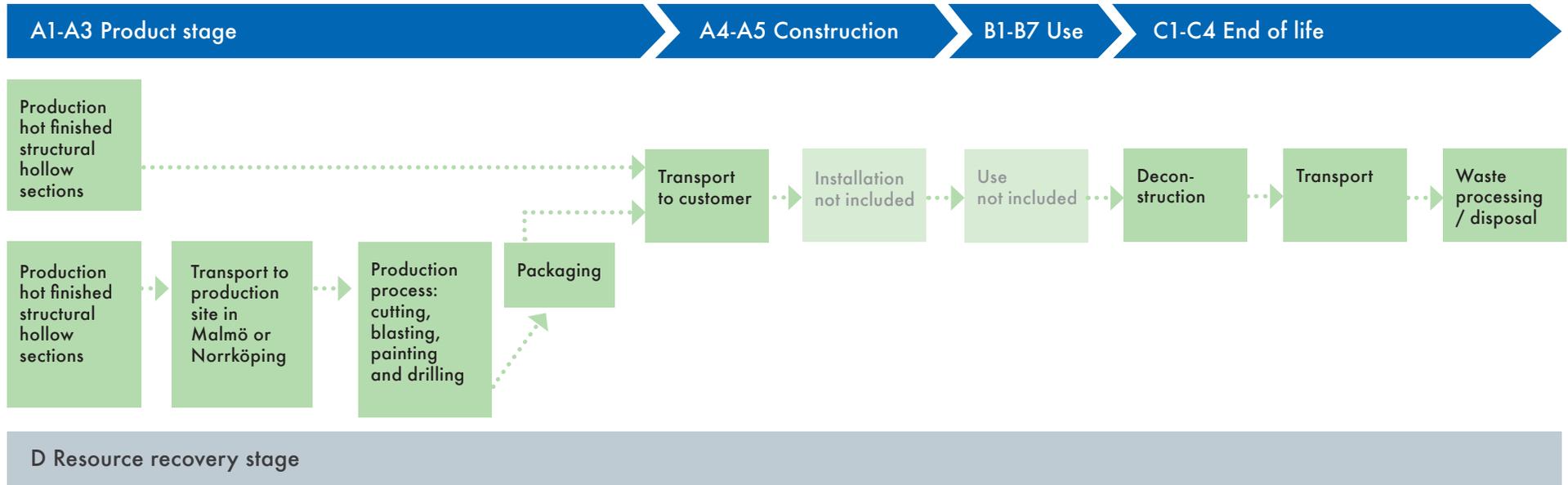
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end of life, it is assumed that dismantling and demolition are carried out by diesel-powered machines that consume 0.01 kWh / kg of product. It is assumed that 100% of the waste is taken care of (C1). Distance for transportation to treatment is assumed to be 50 km and the transportation method is assumed to be lorry (C2). 95% of the hollow sections are assumed to be recycled, this assumption is based on World Steel Association, 2020 (C3). It is assumed that 5% of the product is taken to landfill (C4). Due to the recycling process the end-of-life product is converted into recycled steel (D).

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data 2020

DECLARED AND FUNCTIONAL UNIT

Declared unit 1 kg of hot finished structural hollow sections

Mass per declared unit 1kg

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C 0

Biogenic carbon content in packaging, kg C 0

SYSTEM BOUNDARY

This EPD covers the cradle to gate with options scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

Product stage			Assembly stage		Use stage								End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D	
x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x	
Geography, by two-letter ISO country code or regions.																			
EU	EU	EU	EU	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU			
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling	

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

Input material for our own production, ancillary materials and packaging material represent together 1,25% of product mass and are well below the cut-off rules. None of these materials contain substances of very high concern. Also the EU pallets are excluded, they have a low mass share compared to the product and are reused. The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

Diesel consumption for trucks used when loading and unloading in the warehouse as well as the use of electricity, district heating for heating the premises, LPG and natural gas for production process is allocated based on volume (mass).

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804-standard.

AVERAGES AND VARIABILITY

The International EPD System additional data requirements

Data specificity and GWP-GHG variability for GWP-GHG for A1-A3.

Supply-chain specific data for GWP-GHG	>90 %
Variation in GWP-GHG between products	-
Variation in GWP-GHG between sites	-

ENVIRONMENTAL IMPACT

Note: additional environmental impact data may be presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	3,17E0	2,1E-1	6,58E-3	3,39E0	6,96E-2	MND	3,3E-3	8,27E-3	2,21E-2	2,64E-4	-1,09E0							
GWP – fossil	kg CO ₂ e	3,17E0	2,1E-1	6,59E-3	3,38E0	7,07E-2	MND	3,3E-3	8,26E-3	2,34E-2	2,63E-4	-1,1E0							
GWP – biogenic	kg CO ₂ e	1,52E-3	5E-5	-1,83E-5	1,55E-3	-9,32E-3	MND	9,17E-7	4,44E-6	-1,34E-3	5,22E-7	8,15E-3							
GWP – LULUC	kg CO ₂ e	1,61E-3	1,1E-4	2,61E-6	1,73E-3	5,87E-5	MND	2,79E-7	2,96E-6	2,66E-5	7,82E-8	3,04E-5							
Ozone depletion pot.	kg CFC ₁₁ e	1,89E-7	4,44E-8	5,17E-9	2,39E-7	1,22E-8	MND	7,12E-10	1,89E-9	3,37E-9	1,08E-10	-2,92E-8							
Acidification potential	mol H ⁺ e	1,53E-2	4,33E-3	3,29E-5	1,97E-2	1,37E-3	MND	3,45E-5	4,2E-5	2,84E-4	2,5E-6	-4,24E-3							
EP-freshwater ²⁾	kg Pe	1,85E-4	1,45E-6	8,07E-8	1,87E-4	5,51E-6	MND	1,33E-8	6,97E-8	1,62E-6	3,18E-9	-4,41E-5							
EP-marine	kg Ne	2,95E-3	1,12E-3	7,27E-6	4,08E-3	8,11E-4	MND	1,52E-5	1,43E-5	6,27E-5	8,61E-7	-8,34E-4							
EP-terrestrial	mol Ne	3,37E-2	1,25E-2	7,53E-5	4,62E-2	5,55E-3	MND	1,67E-4	1,58E-4	7,28E-4	9,48E-6	-8,82E-3							
POCP (“smog”)	kg NMVOCe	1,52E-2	3,27E-3	5,51E-5	1,86E-2	9,24E-4	MND	4,59E-5	4,5E-5	1,99E-4	2,75E-6	-5,76E-3							
ADP-minerals & metals	kg Sbe	4,67E-6	3,21E-6	4,64E-8	7,93E-6	2,92E-6	MND	5,03E-9	2,25E-7	1,3E-6	2,41E-9	-1,09E-6							
ADP-fossil resources	MJ	2,64E1	2,9E0	8,56E-1	3,01E1	8,89E-1	MND	4,54E-2	1,26E-1	3,25E-1	7,36E-3	-8,1E0							
Water use ¹⁾	m ³ e depr.	2E0	7,96E-3	7,31E-3	2,01E0	2,24E-2	MND	8,46E-5	4,05E-4	4,61E-3	3,4E-4	-1,56E-1							

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	8,72E-1	3,47E-2	2,55E-3	9,09E-1	6,36E-1	MND	2,45E-4	1,77E-3	5,1E-2	5,95E-5	1,08E-1							
Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0							
Total use of renew. PER	MJ	8,72E-1	3,47E-2	2,55E-3	9,09E-1	6,36E-1	MND	2,45E-4	1,77E-3	5,1E-2	5,95E-5	1,08E-1							
Non-re. PER as energy	MJ	2,68E1	2,9E0	8,56E-1	3,05E1	8,89E-1	MND	4,54E-2	1,26E-1	3,25E-1	7,36E-3	-8,1E0							
Non-re. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0							
Total use of non-re. PER	MJ	2,68E1	2,9E0	8,56E-1	3,05E1	8,89E-1	MND	4,54E-2	1,26E-1	3,25E-1	7,36E-3	-8,1E0							
Secondary materials	kg	1,02E-1	0E0	5,1E-6	1,02E-1	0E0	MND	0E0	0E0	0E0	0E0	5,13E-1							
Renew. secondary fuels	MJ	2,23E-5	0E0	0E0	2,23E-5	0E0	MND	0E0	0E0	0E0	0E0	0E0							
Non-ren. secondary fuels	MJ	2,15E-4	0E0	0E0	2,15E-4	0E0	MND	0E0	0E0	0E0	0E0	0E0							
Use of net fresh water	m ³	3,98E-3	3,9E-4	1,83E-4	4,56E-3	2,84E-3	MND	4,01E-6	2,15E-5	1,33E-4	8,05E-6	-7,28E-3							

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,09E-1	3,3E-3	2,81E-4	1,13E-1	2,94E-3	MND	4,88E-5	1,28E-4	0E0	6,87E-6	-1,32E-1							
Non-hazardous waste	kg	1,03E0	1,24E-1	4,02E-3	1,15E0	1,27E-1	MND	5,22E-4	8,76E-3	0E0	5E-2	-1,49E0							
Radioactive waste	kg	1,7E-4	2,01E-5	1,18E-5	2,02E-4	4,98E-6	MND	3,18E-7	8,61E-7	0E0	4,87E-8	5,94E-6							

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0							
Materials for recycling	kg	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	9,5E-1	0E0	0E0							
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0							
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0							

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO ₂ e	3,17E0	2,1E-1	6,59E-3	3,38E0	7,07E-2	MND	3,3E-3	8,26E-3	2,34E-2	2,63E-4	-1,1E0							

8) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production, nuclear, boiling water reactor (Reference product: electricity, high voltage)
Electricity CO ₂ e / kWh	0,00122
District heating data source and quality	Market for heat, district or industrial, natural gas (Reference product: heat, district or industrial, natural gas)
District heating CO ₂ e / kWh	0.014

BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

Ecoinvent database v3.6 (2019) and One Click LCA database.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

Int'l EPD System PCR 2019:14 Construction products, version 1.11 (05.02.2021) EPD. General Programme Instructions of the international EPD® system. Version 4.0

BE Group Sverige AB Hot finished structural hollow sections LCA background report 18.10.2021

ABOUT THE MANUFACTURER

BE Group is a trading and service company, offering a broad range of steel, stainless steel and aluminium products. With extensive expertise and efficient processes in purchasing, logistics and production, we offer inventory sales, production service and direct deliveries to customers based on their specific needs for steel and metal products. The customers mainly operate in the manufacturing and construction industries in Sweden, Finland and the Baltic States. BE Group is certified according to ISO 14001 and ISO 9001.

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	BE Group Sverige AB
EPD author	Jens Karlsson, BE Group Sverige AB
EPD verifier	Hetal Parekh Udas, One Click LCA Ltd
EPD program operator	The International EPD System
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Primary Steel and Aluminium and all Metal-Based Products



VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Hetal Parekh Udas, One Click LCA Ltd
EPD verification started on	2021-09-21
EPD verification completed on	2021-10-21
Supply-chain specific data %	>90% of A1-A3 GWP-GHG/fossil
Approver of the EPD verifier	The International EPD System
Author & tool verification	Answer
EPD author	Jens Karlsson, BE Group Sverige
EPD author training completion	2021-03-23
EPD Generator module	Primary Steel and Aluminium and all Metal-Based Products
Independent software verifier	Ugo Pretato, Studio Fieschi & soci Srl
Software verification date	2021-05-11

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.



Hetal Parekh Udas, One Click LCA Ltd

VERIFICATION AND REGISTRATION (ENVIRONDEC)

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)	
PCR	PCR 2019:14 Construction products, version 1.11
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact .
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
Third party verifier	Hetal Parekh Udas
	Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no



THE INTERNATIONAL EPD® SYSTEM

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ANNEX 1 : ENVIRONMENTAL IMPACTS

- EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	2,58E0	2,08E-1	6,33E-3	2,79E0	6,96E-2	MND	3,27E-3	8,19E-3	2,31E-2	2,58E-4	-1,04E0							
Ozone depletion Pot.	kg CFC ₁₁ e	1,62E-8	3,52E-8	6,51E-9	5,8E-8	1,06E-8	MND	5,63E-10	1,51E-9	2,86E-9	8,59E-11	-2,58E-8							
Acidification	kg SO ₂ e	6,31E-3	3,28E-3	2,23E-5	9,61E-3	8,79E-4	MND	4,87E-6	1,67E-5	1,77E-4	1,04E-6	-3,32E-3							
Eutrophication	kg PO ₄ ³ e	1,25E-3	3,93E-4	5,56E-6	1,65E-3	4,09E-4	MND	8,57E-7	3,43E-6	7,21E-5	2,02E-7	-1,84E-3							
POCP ("smog")	kg C ₂ H ₄ e	9,56E-4	9,16E-5	1,26E-6	1,05E-3	1,92E-5	MND	5,01E-7	1,1E-6	8,28E-6	7,64E-8	-8,6E-4							
ADP-elements	kg Sbe	4,67E-6	3,21E-6	4,64E-8	7,93E-6	2,92E-6	MND	5,03E-9	2,25E-7	1,3E-6	2,41E-9	-1,09E-6							
ADP-fossil	MJ	2,64E1	2,9E0	8,56E-1	3,01E1	8,89E-1	MND	4,54E-2	1,26E-1	3,25E-1	7,36E-3	-8,1E0							